

Claims

1. A flexible absorbent sheet comprising:
 - (a) a superabsorbent polymer component comprising
 - (i) at least one unneutralized acidic water-absorbing resin, and
 - (ii) at least one unneutralized basic water-absorbing resin; and
 - (b) a plasticizing component in an amount of about 0.1 to about 200 parts by weight per 100 weight parts of the superabsorbent polymer component, wherein the sheet contains about 60% to 100%, by weight, of (a) and (b).
2. The sheet of claim 1 wherein the superabsorbent polymer component comprises discrete particles of the acidic resin and discrete particles of the basic resin.
3. The sheet of one of the claims 1 or 2 wherein the superabsorbent polymer component comprises multicomponent superabsorbent polymer particles wherein each particle has at least one microdomain of the acidic resin in contact with, or in close proximity to, at least one microdomain of the basic resin.
4. The sheet of one of the claims 1 to 3 wherein the superabsorbent polymer component comprises particles having a particle size distribution of about 10 to about 810 μm .
5. The sheet of one of the claims 1 to 4 wherein the superabsorbent polymer component comprises particles having a particle size distribution of about 30 to about 375 μm .
6. The sheet of one of the claims 1 to 5 wherein the superabsorbent polymer component comprises particles having a mass median particle size of less than about 400 μm .
7. The sheet of one of the claims 1 to 6 wherein the acidic water-absorbing resin is selected from the group consisting of polyacrylic acid, a hydrolyzed starch-acrylonitrile graft copolymer, a starch-acrylic acid graft copolymer, a saponified vinyl acetate-acrylic ester copolymer, a hydrolyzed acrylonitrile polymer, a hydrolyzed acrylamide copolymer, an ethylene-maleic anhydride copolymer, an isobutylene-maleic anhydride copolymer, a poly(vinylphosphonic acid), a poly(vinylsulfonic acid), a poly(vinylphosphoric acid), a poly(vinylsulfuric acid), a sulfonated polystyrene, a poly(aspartic acid), a poly(lactic acid), and mixtures thereof.

8. The sheet of one of the claims 1 to 7 wherein the basic water-absorbing resin is selected from the group consisting of a poly(vinylamine), a poly(dialkylaminoalkyl(meth)acrylamide), a polymer prepared from the ester analog of an N-(dialkylamino(meth)acrylamide), a polyethylenimine, a poly(vinylguanidine), a poly(allylguanidine), a poly(allylamine), a poly(dimethyldialkylammonium hydroxide), a guanidine-modified polystyrene, a quaternized polystyrene, a quaternized poly(meth)acrylamide or ester analog thereof, poly(vinylalcohol-co-vinylamine), and mixtures thereof.

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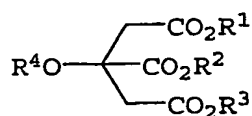
9. The sheet of one of the claims 1 to 8 wherein the plasticizer component is selected from the group consisting of an alcohol, a glycol, a triol, a polyhydroxy compound, an amine alcohol, an amide, a sulfoxide, a glycol ether, a glycol ester, an aprotic solvent, and mixtures thereof.

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10. The sheet of one of the claims 1 to 9 wherein the plasticizer component is selected from the group consisting of glycerol; propylene glycol; ethylene glycol; hexylene glycol; 1,3-butylene glycol; diethylene glycol; triethylene glycol; 1,3-propanediol; pentaerythritol; 1,4-butane diol; diacetone alcohol; water; trimethylolpropane; trimethylolethane; neopentyl glycol; cyclohexanedimethanol; isopropylidene bis(p-phenyleneoxypropanol-2); polyethylene glycol (M.W. 500 or less); polypropylene glycol (M.W. 500 or less); polybutylene glycol (M.W. 500 or less); methanol; ethanol; butanol; mono-, di-, and triacetin; the monomethyl, ethyl, butyl, and phenyl ethers of ethylene glycol, diethylene glycol, propylene glycol, dipropylene glycol, and tripropylene glycol, e.g., monomethyl ether of propylene glycol or monoethyl ether of ethylene glycol; dimethylformamide; diethylformamide; N-methylpyrrolidone; dimethyl sulfoxide; triethanolamine; diethanolamine; tetrahydrofuran; ethylene carbonate; isophorone; dioxane; hexamethylphosphoramide; sorbitol; a sorbitan fatty acid ester; aqueous sucrose; a citrate having a formula:

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wherein R^1 , R^2 , and R^3 , independently, are C_{1-4} alkyl and R^4 is selected from the group consisting of hydrogen, C_{1-4} alkyl, and $\text{C}(\text{O})\text{R}^5$, wherein R^5 is an alkyl group; an ethoxylated alkylphenol; an and propoxylated fatty (C_{6-22}) alcohols; a polyethylene glycol ether of methyl glucose; a polyethylene glycol ether of sorbitol; an ethylene oxide-propylene oxide block copolymer; an ethoxylated ester of fatty (C_{6-22}) acid; a

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condensation product of ethylene oxide with long-chain amine or amide; and mixtures thereof.

5 11. The sheet material of one of the claims 1 to 10 wherein the SAP component is internally plasticized.

 12. The sheet material of one of the claims 1 to 11 wherein the acidic water-absorbing resin comprises poly(acrylic acid); the basic water-absorbing resin comprises poly(vinylamine), polyethylenimine, or a mixture thereof; and the plasticizing agent comprises propylene glycol, glycerol, water, and mixtures thereof.

 13. The sheet of one of the claims 1 to 12 further comprising up to 40%, by weight in total, of one or more optional ingredient.

15 14. The sheet of one of the claims 1 to 13 wherein the optional ingredient is selected from the group consisting of a conventional superabsorbent polymer, a nonabsorbent filler, a nonwoven fiber, a permeation aid, a pigment, and mixtures thereof.

20 15. The sheet material of one of the claims 1 to 14 having a stiffness of less than about 6 mNm.

 16. The sheet material of one of the claims 1 to 15 having a density of about 0.3 to about 0.9 g/cc.

25 17. The sheet material of one of the claims 1 to 16 wherein the sheet is embossed or needle punched.

30 18. An absorbent article comprising a sheet of one of the claims 1 to 17.

 19. The article of claim 18 wherein the article is a diaper or a catamenial device.

35 20. A diaper having a core, said core comprising at least one absorbent sheet of one of the claims 1 to 17.

21. The diaper of claim 20 wherein the core comprises two to five absorbent sheets of one of the claims 1 to 17.

5 22. The diaper of claim 21 wherein at least one of adjacent sheets has a wicking layer disposed between the sheets.

10 23. The diaper of one of the claims 20 to 22 further comprising a topsheet in contact with a first surface of the core, and a backsheet in contact with a second surface of the core, said second core surface opposite from said first core surface.

15 24. The diaper of one of the claims 20 to 23 further comprising an acquisition layer disposed between the topsheet and the core.

25. The diaper of one of the claims 20 to 23 wherein the diaper is free of an acquisition layer.

20 26. The diaper of one of the claims 20 to 25 wherein the sheet is free of cellulosic fibers.

27. The diaper of one of the claims 20 to 26 wherein at least one of the sheets further comprises up to 25%, by weight, of nonwoven fibers.